

Halogenization of the Aromatic Silanes.
VII. Synthesis and Properties of the Chlorine
Derivates of Phenyl-methyl Dichlorosilane That
Contain Chlorine Atoms in the Methyl Group

S/079/60/030/009/009/015
B001/B064

chlorination of the methyl group depends, as was found, on the molar ratio between silane and chlorine (Ref. 6). In consideration of the fact that in phenyl-methyl dichlorosilane, as well as in methyl chlorosilane, the chlorination of the methyl chloride group takes place more easily than in the non-substituted methyl group, the chlorination of phenyl-methyl dichlorosilane (to obtain the monochlorine derivative with one chlorine atom in the methyl group), was carried out in such a way that a considerable amount of the not completely reacted silane remained in the reaction mass. (Details in the experimental part). On initiating the chlorination of phenyl-methyl dichlorosilane with azo-bis-isobutyronitrile ($110-120^{\circ}\text{C}$) the chlorine derivatives of phenyl-methyl dichlorosilane were found to form which contain chlorine atoms in the methyl group only. A chlorination of the aromatic cycle of phenyl-methyl dichlorosilane does not occur in this case. Chlorination of phenyl-methyl dichlorosilane in the presence of the above nitrile occurs without cleavage of the C - Si bond. Phenyl(chloro methyl) dichlorosilane and phenyl(trichloro methyl) dichlorosilane that have hitherto been unknown were separated and identified. A table gives their constants. Phenyl (chloro methyl)-diethoxysilane and phenyl (trichloro-

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Halogenization of the Aromatic Silanes.
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B001/B064

methyl) diethoxysilane were newly synthesized and identified (Scheme 2).
There are 1 table and 6 Soviet references.

SUBMITTED: July 31, 1959

Card 3/3

S/661/61/000/006/022/081
D205/D302

AUTHORS: Motsarov, G. V., Englin, A. L. and Yakubovich, A. Ya.
TITLE: Liquid-phase chlorination of aliphatic and fatty-aromatic silanes in the presence of azo-bis-iso-butylnitrile
SOURCE: Khimiya i prakticheskoye primeneniye kremneorganicheskikh soyedineniy; trudy konferentsii, no. 6, Doklady, diskussii resheniye. II Vses. Konfer. po khimii i prakt. prim. kremneorg. soyed., Len. 1958. Leningrad. Izd-vo AN SSSR, 1961, 110-112

TEXT: Recently, dimethyl dichlorosilane was chlorinated in the presence of azo-bis-iso-butylnitrile yielding 90% of $(CH_3)_2(CCl_3)SiCl_2$ and $(CCl_3)_2SiCl_2$. These are of interest as starting monomers for preparing special silicon rubbers. For preparation of the hexachloro-derivative other conditions are necessary. The synthesis of $(C_6H_5)_2(CCl_3)_2SiCl_2$ was achieved by the chlorination of

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Liquid-phase chlorination ...

S/661/61/000/006/022/081
D205/D302

$(C_6H_5)(CH_3)SiCl_2$. Ye. P. Mikheyev (Moscow), S. A. Golubtsov (Moscow), V. F. Mironov (IOKh, AN SSSR, Moscow) and V. S. Chaganov (IKhS AN SSSR, Leningrad) took part in the discussion concerned with comparison of the two methods of chlorination of dimethyl dichlorosilane, the one using azo-bis-iso-butylnitrile as the initiator and the other employing light. Ye. P. Mikheyev considered light initiation to be usually more effective. G. V. Motsarev disagreed.

Card 2/2

15.9205

S/081/62/000/012/058/063
B158/B101

AUTHORS: Dzhagatspanyan, R. V., Zetkin, V. I., Motsarev, G. V.,
Filippov, M. T.

TITLE: Chlorination of silicon-containing monomers and polymers
under the effect of gamma-radiation

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 12, 1962, 612-613
abstract 12P282 (Sb. "Radioakt. izotopy i yadern. izlucheniya
v nar.kh-ve SSSR. V. I.". M., Gostoptekhizdat., 1961,
197-200) ✓

TEXT: Polydimethylsiloxane rubber (I) and polyphenylmethylsiloxane (II)
as well as a number of monomers were chlorinated at 0°C under the action
of γ -radiation (Co⁶⁰ with an activity of 1400 g-equiv of Ra). Chlorination
of I takes place easily and rapidly until the introduction of an average
of two Cl atoms into the chain of the polymer, after which the process
rate falls sharply. In a metal autoclave at both 0°C and 60°C
destruction of the polymer takes place. With chlorination of II (molar
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S/081/62/00C/012/058/063
B158/B101

Chlorination of silicon-containing ...

ratio of Cl:siloxane = 2:1 and 3:1) substitution and addition chlorination takes place in the aromatic ring. With chlorination of $(\text{CH}_3)_3\text{ClSi}$ (molar ratio of Cl_2 :silane = 0.51:1) the basic product is a monochlorine derivative; chlorination of 18.6 g of ethyl-trichlorosilane (molar ratio of Cl_2 :silane = 0.35:1) gives 6.5 g of α and β -chloroethyl-trichlorosilanes. Chlorination of methyl-phenyl dichlorosilane results in the formation of $(\text{C}_6\text{H}_2\text{Cl}_3)(\text{CCl}_3)\text{SiCl}_2$ (b. p. 185-188/10 mm). [Abstracter's note: Complete translation.]

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21135

S/190/61/003/004/010/014
B101/B207

15 816

AUTHORS: Dzhagatspanyan, R. V., Zetkin, V. I., Motsarev, G. V.,
Filippov, M. T.

TITLE: Chlorination of organo-silicon monomers and polymers under
the action of gamma rays. I. Chlorination of liquid poly-
phenyl-methyl siloxane and of polydimethyl siloxane rubber.
The infrared spectra of the chlorination products

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 3, no. 4, 1961, 607-612

TEXT: In the introduction, the authors state that initiating the chlorina-
tion of organosilicon compounds by means of ultraviolet light proceeds too
slowly, however, that chemical initiators as e.g., benzoyl peroxide re-
quire a higher temperature at which a sufficient chlorination of methyl
chloro silanes is not possible owing to their instability. Therefore, the
present study aimed at initiating chlorination by means of gamma rays of
Co⁶⁰ at low temperatures. The following compounds were chlorinated:
1) Polyphenyl-methyl siloxane (poly-PMS) (molecular weight 2000), and 2)
three samples of polymethyl siloxane rubber (poly-MSR) (molecular weight

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S/190/61/003/004/010/014
B101/B207

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Chlorination of .

400,000-500,000). 4-5% solutions of the polymers in CCl_4 were used, to which chlorine taken from the cylinder was added. The samples were irradiated in sealed ampoules at 0°C with gamma rays of Co^{60} , activity 1400 Ci, equivalent to 1400 Ci of radium. Tables 1 and 2 list the results. Heating with 40% KOH of a chlorinated poly-PMS sample with 55-56% Cl yielded a paste from which crystals with a chlorine content of 64.3-66.7% were separated. On the basis of analytical results, they obtain the empirical formula $\text{C}_6\text{H}_6\text{Cl}_4$ or $\text{C}_6\text{H}_4\text{Cl}_4$.

The infrared spectra of the oily residue of hydrolysis showed an intensive band at $9-10 \mu$ which corresponds to the Si-O bond. Chlorination of poly-MSR led, according to the sample used, to quite different results with respect to the intensity of reaction and the chlorine content of the product obtained. This is due to impurities (catalyst residues) in commercial poly-MSR. Study of the infrared spectra yielded 3690 and 3615 cm^{-1} bands both in initial and chlorinated rubber. These bands are due to OH groups (3690 cm^{-1} free OH; 3615 cm^{-1} OH with H bond). Accordingly, commercial poly-MSR contains silanol groups. As a result of spectral analysis the following is stated: though the IR spectra of chlorinated poly-PMS and poly-MSR differ from those of the initial samples, no absorption bands were found to exist which are characteristic of chlorinated substances.

Card 2, 5

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S/190/61/003/004/010/014
B101/B207

Chlorination of ...

There are 2 figures, 5 tables, and 14 references: 8 Soviet-bloc and 6 non-Soviet-bloc. The 2 references to English-language publications read as follows: Ch. Tamborcki, H. W. Post, J. Org. Chem., 17, 1400, 1952; C. W. Joung, P. C. Servais, C. C. Currie, M. J. Hunter, J. Amer. Chem. Soc., 70, 3750, 1948.

SUBMITTED: July 15, 1960

Опыт №	Загружено реагентов, г		Соотношение молей Cl основомоль	Мощность дозы, р/сек	Время облучения, мин	Пес продукта, г	Содержание хлора, %	
	кварц	полимер					суммарно	вычислено
1	4,70	4,05	1,97 : 1	70	30	8,874	48,8	51
2	7,2	4,85	2,98 : 1	70	30	11,425	59,5	61
3	4,9	3,12	3 : 1	120	2	6,4819	50,1	61
4	4,9	3,12	3 : 1	120	5	7,0128	54,6	61
5	4,9	3,12	3 : 1	120	10	7,6840	50,7	61
6	2,43	4,08	1 : 1	120	15	7,1914	33,9	34,3
7	3,3	3,12	2,03 : 1	120	15	5,9615	50,2	51

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MOTSAREV, G.V.; ROZENBERG, V.R.; MINDLIN, Ya. I.

Particular aspects to phenylmethyldichlorosilane chlorination.
Zhur. VKhO 6 no. 353-354 '61. (MIRA 14:6)
(Silane) (Chlorination)

MOTSAREV, G.V.; ROZENBERG, V.R.

Halogenation of aromatic silanes. Part 8: Preparation and
properties of chlorine derivatives of phenylmethyldichlorosilane
containing chlorine atoms in the aromatic nucleus. Zhur.ob.khim.
31 no.6:2004-2011 Je '61. (MIRA 14:6)
(Silane) (Halogenation)

25391

S/080/61/034/002/011/025
A057/A129

158170

AUTHORS: Motsarev, G.V., Rozenberg, V.R., Chashnikova, T.Ya.

TITLE: Preparation of monochloromethyl-methyldichlorosilane

PERIODICAL: Zhurnal Prikladnoy Khimii, v 34, no 2, 1961, 356-362

TEXT: This is the first paper in a series concerning halogenation of aliphatic silanes and siloxanes. Preparation of chloro-substituted methylchlorosilanes by initiated chlorination of the latter in the presence of azo-bis-isobutyronitril (investigated already in previous works) was studied in details. Particularly reactions to obtain monochloro-substituted dimethylchlorosilane were investigated. Chlorination experiments were carried out in the liquid phase without solvent and light and initial contents of initiator not exceeding 0.05%, while the total maximum consumption was 0.2%. The initiator was added by batches corresponding to the decrease of HCl liberation or in the continuous process together with

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S/080/61/034/002/011/025

Preparation of monochloromethyl-methyldichlorosilane

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the initial silane. Two series of experiments were carried out, i.e., periodical (reaction products were separated from the reaction zone) and continuous chlorination (no separation of reaction products). It was observed that the main factor determining the degree of chlorination of the methyl group in dimethylchlorosilane is the molal ratio silane : chlorine. Decrease of the molal ratio increases the content of di-(poly)-chloro-substituted derivatives. The effect of the ratio between dimethyldichlorosilane and chlorine on the results of chlorination obtained by the batch process can be seen from Tab. 1. Continuous chlorination experiments were carried out at 60°C with 0.2% of initiator, varying molal ratio silane/chlorine and contact time. The results (Tab. 2) indicate the same effect of the silane/chlorine ratio on the reaction product as in batch chlorination, i.e., decrease of the molal ratio increases the content of di-(poly)-chloro-substituted derivatives in the product. In order to obtain a maximum yield of mono-chloromethyl-methyldichlorosilane in continuous chlorination of dimethyldichlorosilane (separating the chlorination product from the reaction zone) the molal ratio $(\text{CH}_3)_2\text{SiCl}_2 : \text{Cl}_2$ must be greater than in

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45391

S/080/61/034/002/011/025

A057/A129

Preparation of monochloromethyl ~~ethyl~~ dichlorosilane

the batch process. Maximum yield in continuous chlorination is obtained at a molal ratio of $(CH_3)_2SiCl_2 : Cl_2 = 1 : 0.3$ and a contact time of 0.5 hr. There are 3 figures, 2 tables and 6 Soviet-bloc references.

SUBMITTED: June 14, 1960

Card 3/6

25397

S/080/61/034/002/019/025
A057/A129

15 8170

AUTHORS:

Metsarev, G.V., Rubanov, V.R., Chasnikova, T.Ya.

TITLE:

Preparation and properties of polychlorosubstituted dimethyl-
dichlorosilane and dimethyldiethoxysilane

PERIODICAL:

Zhurnal Prikladny Khimii, 34, no. 2, 1961, 430-440

TEXT:

This is the 2nd communication in the series of aliphatic
silanes and siloxanes. A detailed investigation of chlorogating chlori-
nation of dimethyldichlorosilane was made to obtain tri-, tetra-, penta-
and hexachloro-substituted products. The following new compounds were
separated and characterized: dichloromethylmethyl-, trichloromethylmethyl-,
trichloromethylchloromethyl-, and chloromethylidimethyl- and bis(tri-
chloromethyl)-diethoxysilane and also tri chloromethyltriethoxysilane. The
present investigations were necessary, since in literature the only publica-
tion concerning chlorogating chlorination of dimethyldichlorosilane publish-

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25397

S/060/01/014/002/019/025

A092/A029

Preparation and properties of ...

ed by F. Runge and W. Zimmermann (Ref. 1a, Ber. 91, 240 (1954)) does not contain data on the chemistry of the process and properties of the products. Dimethylchlorosilane was chlorinated in the present experiments at different temperatures in CCl_4 as solvent, CCl_4 being at the same time as initiator. Also photochlorination was carried out with ultraviolet light source was a PRK-2 (PRK-2) quartz lamp. Since a single polychlorosubstituted of dimethylchlorosilane could not be separated from the reaction mixture, etherification with absolute ethanol was carried out and the obtained polychlorodimethylchlorosilanes were isolated by reprecipitation (Tab.). Composition of the obtained products was determined by hydrolysis of the chlorosilanes with water in aqueous NaOH solution forming the corresponding chloromethanes. By chlorination of dimethylchlorosilane $(\text{CH}_3)_2\text{SiCl}_2$ at 60°C - 105°C using 3.0 moles of Cl_2 per mole of $(\text{CH}_3)_2\text{SiCl}_2$ the trichlorosubstituted is obtained with a 95.1% yield. No side reactions due to splitting of the Si-C bond were observed. Using the ratio of $(\text{CH}_3)_2\text{SiCl}_2 : \text{Cl}_2 = 1 : 4.7$ under the same conditions a mixture of tri-, tetra- and pentachlorosubstituted containing 4.1% of tetrachlorodimethylchlorosilane can be obtained. In continued chlorination (molar ratio of

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S/C80/61/034/002/1:9/025
A057/A:29

Preparation and properties of

$(CH_3)_2SiCl_2$ and $SiCl_4$ (1:1) the products can be obtained with a 17.1% yield. Simultaneously with the chlorination a side reaction occurs, i.e., a splitting reaction of the chlorination products in the Si-Cl bond. It was observed that this side reaction (destructive chlorination) inhibits formation of bis-(trimethylsilyl) dichlorosilane (II), but at a ratio of $(CH_3)_2SiCl_2$: $SiCl_4$ = 1:1 (0.2 ml) $SiCl_4$ and CCl_4 were formed.

Chlorination was carried out, therefore, under softer conditions, i.e., at 60°C in a CCl_4 medium (ratio of $(CH_3)_2SiCl_2$: $SiCl_4$ = 1:1 (2.5) and (II) was obtained with a 45% yield. Using $SiCl_4$ chlorination the temperature could be lowered even more (to 20°C) and thus a 60% yield of (II) could be obtained. Thus increasing temperature increases the splitting process and decreases the yield of (II). The bis-(trimethylsilyl) dichlorosilane could be isolated by crystallization. It was determined by hydrolysis that all three chlorine atoms are in the CH_3SiCl_2 group. It was observed that stability of the Si-Cl bond increases with increasing chlorination degree of the methyl groups. There is a table and 3 references: 3 Soviet-bloc and 4 non-Soviet-bloc. The three English language publications read as

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S/844/62/000/000/066/129
D204/D307

AUTHORS: Dzhagatspanyan, R. V., Zetkin, V. I., Motsarev, G. V.
and Filippov, M. T.

TITLE: The chlorination of phenylmethyldichlorosilane (I) and
dimethyldichlorosilane (II) under the action of γ -irradi-
ation

SOURCE: Trudy II Vsesoyuznogo soveshchaniya po radiatsionnoy khimii.
Ed. by L. S. Polak. Moscow, Izd-vo AN SSSR, 1966,
386-389

TEXT: I was chlorinated in sealed ampoules, at 0 and 20°C, under
 γ -irradiation (~120 r/sec, over 15 or 30 min), with molar ratios
(n) of Cl_2 : I equal to 0.25:1, 0.5:1, and 1:1, since polychlori-
nated silanes are of interest in preparing fluorinated Si-contain-
ing monomers and polymers. In contrast to chemically initiated
chlorination of I, the present reaction was one of addition of Cl_2
into the aromatic ring rather than substitution into the methyl
Card 1/2

The chlorination of ...
group, the

S/844/52/000/000/000 :
D204/D307

tion of ...
group, the main product being a viscous oil, which by chemical and
infrared spectroscopic tests proved to be $\text{CH}_3\text{C}_6\text{H}_5\text{Cl}_2\text{SiCl}_2$. A small amount
of CH_3 -chlorinated compounds was also formed. No product in which
chlorination of CH_3 - and C_6H_5 -groups occurred simultaneously was
observed, although it might form in initial mixtures rich in
 Cl_2 . Silane II was similarly chlorinated at 0°C , with molar ratios
0.3:1 and 0.5:1, under 2 min doses of γ rays at 1.0 r/sec. The
yields of the monochloride and 5 to 17% yields of the dichloride,
the latter becoming greater with increasing n. These results are in
agreement with the data of the literature.

ASSOCIATION: NII Goskomiteta, Soveta Ministrov
(NII for Chemistry, Ministry of Chemical Industry)
Ministry of Chemical Industry

ASSOCIATION: NII Goskomiteta, Soveta Ministrov SSSR po Zdraviu
(NII for Chemistry of the State Committee, Chemists
Ministers of the USSR)

Card 2/2

S/190/62/004/007/007/009
B119/B180

AUTHOR: Motsarev, G. V.
TITLE: Chlorination of dimethyl siloxane rubber
PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 4, no. 7, 1962,
1084-1087

TEXT: Dimethyl siloxane rubber, molecular weight 400,000, was made to react in a CCl_4 medium with elementary chlorine at 50°C in the presence of azoisobutyronitrile. The polymer changes consistency and, as the Cl content rises, becomes sticky, then plastic, and finally solid. At 63-68% Cl, which corresponds to $[(\text{C}_2\text{H}_2\text{Cl}_4)\text{SiO}]_n$, the reaction product can be pulverized. Chlorination is associated with side reactions leading to rupture of the polymer chain at the Si-O-Si bond, and to the formation of only slightly soluble polymers of low molecular weight (intrinsic viscosity of the product containing 63.3% Cl is almost 15 times lower than that of the initial substance). Hydrolysis of the chlorination product with the initial agents (2N KOH solution in $n\text{-C}_4\text{H}_9\text{OH}$) produced mixtures of CH_3Cl .

S/190/62/004/007/007/009
B119/B180

Chlorination of dimethyl siloxane ...

CH_2Cl_2 , and CHCl_3 . In no case was CHCl_3 obtained alone. This shows that it is impossible to synthesize chlorinated methyl siloxane polymers which consist of $[(\text{CCl}_3)_2\text{SiO}]$ links alone. There are 2 tables. The most important English-language reference is: R. H. Kriebel, J. R. Elliott, J. Amer. Chem. Soc., 68, 2291, 1946; E. A. Flood, J. Amer. Chem. Soc., 55, 1735, 1933.

SUBMITTED: May 29, 1961

Card 2/2

S/079/62/032/003/005/007
D204/D302

AUTHORS: Motsarev, G.V. and Rosenberg, V.P.

TITLE : Halogenation of aromatic silanes. IX. Photochemical chlorination of phenyl-methyl-dichlorosilane (A)

PERIODICAL: Zhurnal obshchey khimii, v. 32, no. 3, 1962, 909-915

TEXT: The above was studied, in view of the absence of data on the photochemical gaseous chlorination of aromatic chlorosilanes, using ultraviolet initiation, at 20-25°, over 12 hours. With A: Cl₂ ratio equal to 1:3.2, phenyl chloromethyl dichlorosilanes were obtained in ~74% yield (chiefly Ph(CCl₃) SiCl₂(I) - 50.8% and Ph(CHCl₂) SiCl₂). Increasing the reagent ratio to 1:6 increased the yield of I to 61.7%. Chlorination of the benzene ring took place simultaneously, yielding 17-23% of Cl₆C₆H₅(CH₃)SiCl₂ (II). No compounds containing both the hexachlorocyclohexyl and CHCl₂ - or CCl₃ - groups were found, owing to the deactivation of the aromatic

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Halogenation of aromatic ...

S/079/62/032/003/005/007

D204/J332

ring by chlorinated CH_3- . The reaction is discussed, the authors concluding that the chlorination of CH_3- proceeds by a radical chain mechanism, and that of C_6H_5- occurs by stepwise addition of molecular chlorine. Physical and chemical properties of the products were studied. Acid hydrolysis of II yielded a compound assumed to be $[\text{C}_6\text{H}_5\text{Cl}_6(\text{CH}_3)\text{SiO}]_n$, whilst aq. KOH split the Si-C bond giving hexachlorocyclohexane which dehydrohalogenated to 1,2,4 trichlorobenzene. Alkaline hydrolysis of I gave CHCl_3 and $[\text{C}_6\text{H}_5\text{SiO}_{1.5}]_n$. $\text{Ph}(\text{CHCl}_2)\text{Si}(\text{OEt})_2$, $\text{Cl}_6\text{C}_6\text{H}_5(\text{CH}_3)\text{Si}(\text{OEt})_2$ and $\text{Cl}_6\text{C}_6\text{H}_5(\text{CH}_2\text{Cl})\text{Si}(\text{OEt})_2$ were obtained for the first time by the alcoholysis of the corresponding dichlorosilanes with EtOH. Physical constants of these products are tabulated. Full experimental details are given. There are 1 table and 6 references: 4 Soviet-bloc and 2 non-Soviet-bloc. The references to the English-language publications read as follows: K.G. Denbigh, Trans.Farad.Soc., 36, 936, (1940); E.L. Warwick, J.Am.Chem.Soc., 68, 2455, (1946).

SUBMITTED: March 14, 1961

Card 2/2

S/079/62/032/011/011/012
D204/D307

AUTHORS: Motsarev, G.V., and Rosenberg, V.R.

TITLE: Halogenation of aromatic silanes. X. Liquid phase thermal chlorination of phenylmethyldichlorosilane

PERIODICAL: Zhurnal obshchey khimii, v. 32, no. 11, 1962, 3727 - 3731

TEXT: Chlorination of PhMeSiCl_2 (I) in diffuse daylight with gaseous Cl_2 , at 50-55°C, over 30 hrs., with a molar ratio (n) of I: Cl_2 of 1:10.5, in the absence of initiators and catalysts, gave ~80 % of di- and trichlorophenylmethyldichlorosilanes; a side reaction consisting of the C(aromatic)-Si fission also occurred, giving CH_3SiCl_3 , PhCl and $\text{C}_6\text{H}_4\text{Cl}_2$. The yields of chlorophenyl(methyl) di-chlorosilanes decreased to ~50-60 % at 110-115°C. At 145-150°C over 15 hrs. at n = 1:8, chlorination of the CH_3 - group also took place, by a radical mechanism parallel with the chlorination of the aromatic ring, followed by a fission of the C(aliphatic)-Si bond to

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Halogenation of aromatic silanes. ...

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D204/D307

give CCl_4 and mono- and dichlorophenyltrichlorosilanes. Hydrolysis of $\text{C}_6\text{H}_{5-n}\text{Cl}_n(\text{CH}_3)\text{SiCl}_2$ with aqueous KOH showed that the CH_3SiCl_2 -group is essentially meta-directing w.r.t. aromatic substitution of chlorine, similarly to the SiCl_3 -group in PhSiCl_3 . The first product is thus $(\text{m-ClC}_6\text{H}_4)(\text{CH}_3)\text{SiCl}_2$, which is then further chlorinated to a mixture of 3,6- and 3,4-dichlorophenylmethyldichlorosilanes. The compounds were characterized by converting them to chlorophenyltriethoxysilanes with absolute ethanol. T.T. Tarasova, V.T. Inshakova and Z.F. Kirbyakova assisted in the experimental part of this work.

SUBMITTED: November 13, 1961

Card 2/2

15.7205

S/080/62/035/004/013/022
D247/D301

AUTHOR:

Motsarev, G. V.

TITLE:

Production and properties of chlorine-substituted octamethylcyclotetrasiloxane

PERIODICAL:

Zhurnal prikladnoy khimii, v. 35, no. 4, 1962, 614-616

TEXT: The effects of different molar proportions of chlorine to siloxane on the chlorination process were tabulated. To obtain monochloromethylheptamethylcyclotetrasiloxane, chlorine vapor was passed over octamethylcyclotetrasiloxane to which small quantities of azobisisobutyronitrile were added periodically as an initiator. After 100 minutes at 60°C, the products were fractionally distilled under vacuum. Physical properties of the fractions were recorded and an analysis for chlorine was made. To give increased substitution, chlorine was passed over octamethylcyclotetrasiloxane with the initiator for 16 1/2 hours. The temperature was raised after 12 hours from 60°C to 110°C. A paraffin-like mass was obtained. Hydrolysis of the product with sodium hydroxide gave methylene chloride and

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Production and properties ...

S/080/62/035/004, 0-3, 022
D247/D301

chloroform, indicating that the Si-O-Si bond was not broken during chlorination. There are 3 figures and 15 references: 7 Soviet-bloc and 8 non-Soviet-bloc. The 4 most recent references to the English-language publications read as follows: J. R. Elliott and E. R. Billebuech, J. Am. Chem. Soc., 74, 1853, (1952); R. McGregor and E. Warrick, US Pat. 2,522,093, (1950); J. L. Speier, J. Am. Chem. Soc., 73, 324, (1951); J. L. Speier, US Pat. 2,510,143, (1950), Brit. Pat. 622,491, (1949).

SUBMITTED: May 3, 1951

Card 2/2

MOTSAREV, G.V.; ROZENBERG, V.R.; TARASOVA, T.T.

Halogenation of aromatic silanes. Part 14: Bromination of phenyl-
methyldichlorosilane. Zhur. ob. khim. 34 no.9:2911-2915 3 '64.
(MIRA 17:11)

S/076/62/036/008/004/011
B101/B144

AUTHORS: Filippov, M. T., Dzhagatspanyan, R. V., Motsarev, G. V., and
Zetkin, V. I.

TITLE: Infrared spectra of organochlorosilanes containing chlorine
in the organic group

PERIODICAL: Zhurnal fizicheskoy khimii, v. 36, no. 8, 1962, 1751 - 1754

TEXT: IR spectra of $\text{CH}_3\text{C}_6\text{H}_5\text{SiCl}_2$ (I); $\text{CH}_2\text{ClC}_6\text{H}_5\text{SiCl}_2$ (II); $\text{CHCl}_2\text{C}_6\text{H}_5\text{SiCl}_2$ (III); $\text{CCl}_3\text{C}_6\text{H}_5\text{SiCl}_2$ (IV); $(\text{CH}_3)_2\text{SiCl}_2$ (V); $\text{CH}_2\text{ClCH}_3\text{SiCl}_2$ (VI), and $\text{CHCl}_2\text{CH}_3\text{SiCl}_2$ (VII) were studied with the following results: (1) The 3.35 and 3.4 μ bands correspond to the asymmetric and symmetric stretching vibrations of CH in the methyl group. (2) The position of the bands in the range 11-16 μ strongly depends on the degree of chlorination: The 11.76 - 12.7 μ band of V in VI becomes weaker and is shifted toward longer waves; in VII it splits into two bands. (3) The 12.58 μ band of I corresponds to the Si-bound CH_3 group. It changes with the degree of

Card 1/2

Infrared spectra of...

S/076/62/036/008/004/011
B101/B144

chlorination and disappears in IV. (4) The bands of 13-15 μ for I-IV correspond to the C_6H_5 groups. (5) The 15.62 μ band of VI and the 15.38 μ band of II are ascribed to the $SiCH_2Cl$ group. There are no bands in this range for the other compounds. (6) In the case of IV, 11.36 and 11.90 μ bands were observed which appear due to symmetric and asymmetric stretching vibrations of the C-Cl bond in CCl_3 . This was confirmed by the fact that $CCl_3(CH_3)Si(OC_2H_5)_2$ and $(CCl_3)_2Si(OC_2H_5)_2$ also showed bands in the range 11-11.4 μ which were absent in compounds containing no CCl_3 group. There are 5 figures and 2 tables.

SUBMITTED: November 9, 1960

Card 2/2

S/079/63/033/001/018/023
D204/D307

AUTHORS: Motsarev, G. V. and Rozenberg, V. R.

TITLE: Halogenation of aromatic silanes. XI. The addition of chlorine of phenylmethyldichlorosilane. The preparation of hexachlorocyclohexyl(methyl)dichlorosilane

PERIODICAL: Zhurnal obshchey khimii, v.33, no. 1, 1963, 255-258

TEXT: A continuation of earlier work (ZhOKh, 32, 3727 (1962)), concerned with the chlorination of PhMeSiCl_2 at 50 - 150°C. In the present study the chlorinations were conducted at lower temperature, owing to the lack of literature data concerning such reactions. In diffuse daylight, at 0 - 5°C, bubbling of gaseous Cl_2 into the silane (molar ratio 3.71 moles Cl_2 per mole silane, at the rate of 10 g/hr) resulted in hexachlorocyclohexyl(methyl)dichlorosilane as the main product (b.p. 174 - 179°C/5 mm Hg, $d_{20}^{20} = 1.6868$,

Card 1/2

Halogenation of aromatic ...

S/079/63/033/001/018/023
D204/D307

$n_D^{20} = 1.5673$), in 78.4% yield. On raising the temperature to 20-25°C and the Cl_2 :silane ratio to 10:1, the yield of $\text{C}_6\text{H}_5\text{Cl}_6(\text{CH}_3)\text{SiCl}_2$ fell to 46% and $\text{C}_6\text{H}_3\text{Cl}_2(\text{CH}_3)\text{SiCl}_2$ was obtained in 19.6% yield. Higher temperature thus promotes substitution into the aromatic ring. T. T. Tarasova and E. F. Kirbyakova took part in the experimental work.

SUBMITTED: February 5, 1962

Card 2/2

L 10662-63

EPF(c)/EWP(j)/EWT(m)/BDS--ASD--Pr-4/Pc-4--RM/VW

S/079/63/033/004/009/010 64

AUTHOR:

Motsarev, G.V., Rozenberg, V.R., Tarasova, T.T.

TITLE:

Halogenation of aromatic silanes. XII. The obtaining and the properties of chlorine derivatives of n-tolylmethyldichlorosilane with atoms of chlorine in methyl groups. The synthesis of n-trichloromethylphenyltrichloromethyldichloro(ethoxy)silanes

PERIODICAL:

Zhurnal obshchey khimii, v. 33, no. 4, 1963, 1299-1303

TEXT:

It is established that upon the initiation of the reaction of chlorination of n-tolyl(methyl)dichlorosilane by azobisisobutyronitrile (110-115 degrees), chlorine derivatives of n-tolyl(methyl)dichlorosilane with an atom of chlorine in the methyl groups are formed. In this case the first CH₃ group which is chlorinated is the one in the aromatic ring which is in the

Card 1/2

L 10662-63

S/079/63/033/004/009/010

Halogenation of aromatic silanes...

para position with respect to the atom of silicon. The chlorination of n-tolylmethyldichlorosilane in the presence of azobisisobutyronitrile, in contrast to the chlorination of phenylmethyldichlorosilane, is accompanied by destructive halogenation involving the splitting of the silane molecule at the C-Si link. Synthesized for the first time are n-dichloromethylphenyl(methyl)dichlorosilane, n-trichloromethylphenyl(trichloromethyl)dichlorosilane, and n-trichloromethylphenyl(trichloromethyl)diethoxysilane.

SUBMITTED: May 8, 1962

kes/*[signature]*
Card 2/2

S/080/63/036/001/026/026
D204/D307

AUTHORS:

Motsarev, G.V. and Rozenberg, V.R.

TITLE:

On the problem of preparing bis(trichloro-
methyl)dichlorosilane

PERIODICAL:

Zhurnal prikladnoy khimii, v. 36, no. 1,
1963, 231 - 232

TEXT:

The present work is communication IV in the series of papers dealing with the halogenation of aliphatic silanes and siloxanes. Bis(trichloromethyl)dichlorosilane (I) was prepared in 44% yield by passing gaseous Cl_2 into a solution of 210 g $\text{Cl}_3\text{C} \cdot \text{CH}_3\text{SiCl}_2$ in 20 g Cl_2 , at 60°C , over 66 hrs, at 6.1 g/hr, using azo-bis-iso-butyronitrile as an initiator. $\text{CCl}_3\text{SiCl}_3$ and $\text{CCl}_3 \cdot \text{CHCl}_2\text{SiCl}_2$ formed as by-products. Compound I could also be prepared in CCl_4 (not less than 5 mol %) using uv irradiation as the initiator, at $20 - 25^\circ\text{C}$, over 66 hrs, at 6.1 g Cl_2 /hr. The latter method yielded 60 % of I. $\text{CCl}_3 \cdot \text{SiCl}_3$

Card 1/2

On the problem of preparing ...

S/080/63/036/001/026/026
D204/D307

and $\text{CCl}_3\text{CHCl}_2\text{SiCl}_2$ formed as by-products. E.F. Kirbyakova and
V.T. Inshakova took part in the experimental work.

SUBMITTED:

November 13, 1961

Card 2/2

44563

S/020/63/148/001/024/032

B106/B186

53700

AUTHORS: Motsarev, G. V., Yakubovich, A. Ya., Rozenberg, V. R.

TITLE: Production and properties of hexachloro cyclohexyl
chlorosilanes

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 148, no. 1, 1963, 116-117

TEXT: The addition of chlorine to phenyl trichlorosilane (I) and phenyl methyl dichlorosilane (II) was studied for the first time. Under the action of chlorine at 0-2°C in diffuse daylight, both compounds yield exclusively the addition products hexachloro cyclohexyl trichlorosilane (III) (28.2% yield) and hexachloro cyclohexyl(methyl) dichlorosilane (IV) (78.4% yield). Ultraviolet light considerably increases yield and reaction rate. The yield of addition products decreases with increasing reaction temperature, and substitution occurs. Substitution occurs exclusively at 120°C (compound I) and 50°C (compound II). Additive chlorination of aromatic chlorosilanes, especially of compound II, proceeds much more readily than chlorination of benzene. This is explained by the fact that the electrophilic silyl chloride group disturbs the symmetry of the π -electron cloud of the benzene ring, and

Card 1/3

Production and properties of ...

S/020/63/148/001/024/032
B106/B186

deactivates the phenyl radical for substitution reactions. Compound II, the silicon atom of which is less electrophilic, undergoes additive chlorination more readily than compound I. Therefore, there is a relationship between the electrophilic effect of the substituents and the rate of additive chlorination of substituted aromatic compounds. .
Compounds III and IV are colorless, viscous liquids which fume slightly in air, are soluble in organic solvents, and crystallize when standing for a long time (m.p. 90-93°C). Their wide boiling ranges (Table 1) are due to the existence of stereoisomeric mixtures. Under the action of water, they are hydrolyzed to siloxanes; in lyes, the hexachloro cyclohexyl radical is split off, and goes over into trichlorobenzene with separation of hydrogen chloride. III and IV react with ethanol to give hexachloro cyclohexyl ethoxy silanes (Table 1). There is 1 table.

PRESENTED: April 12, 1962, by I. L. Knunyants, Academician
SUBMITTED: April 4, 1962

Card 2/3

ACCESSION NR: AP4010486

S/0080/64/037/001/0132/0136

AUTHOR: Motsarev, G. V.; Rozenberg, V. R.

TITLE: Producing monochlormethyl(dimethyl)chlorosilicate

SOURCE: Zhurnal prikladnoy khimii, v. 37, no. 1, 1964, 132-136

TOPIC TAGS: chlorination, dimethyl chlorosilicate, chlorosilicate, induction effect, chlorine atoms, silicon, polychlorides, silicate-chlorine ratio, molar ratio, trimethyl chlorosilicate, azo-bis-isobutyronitrile

ABSTRACT: In the experiment under consideration trimethyl chlorosilicate was chlorinated by the same method as dimethyl dichlorosilicate; the process took place in a liquid phase and was initiated by azo-bis-isobutyronitrile. The amount of mono- and di(poly)chlorine-substitutions of trimethylchlorosilicate is determined primarily by the molar ratio of the initial reagents, silane and chlorine, that is, by the extent of the initial silane conversion. An experiment in chlorinating trimethyl chlorosilicane in a continuous flow system and with

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ACCESSION NR: AP4010486

different silane-chlorine molar ratios was based on a similar method. The study of the liquid-phase chlorination of trimethyl chlorosilicate in the presence of azo-bis-isobutyronitrile, with and without the withdrawal of the chlorination products from the reaction zone, has led to the conclusion that the major factor affecting the composition of the trimethyl chlorosilicate chlorination products was the silane-chlorine molar ratio. The content of the polychlorine-substitutions in the reaction mixture decreases as that ratio increases. Orig. art. has: 3 figures, 2 tables.

ASSOCIATION: none

SUBMITTED: 08May62

DATE ACQ: 14Feb64

ENCL: 00

SUB CODE: CH

NO REF SOV: 001

OTHER: 002

Card 2/2

MOTSAREV, G.V.; ROZENBERG, V.R.

Thermal decomposition of trichloromethyltrichlorosilan . Zhur.
prikl. khim. 37 no. 4:747-749 Ap '64. (MFA 17:5)

MOTSAREV, G.V.; ROZENBERG, V.R.

Initiation of the reaction of chlorination of methylchlorosilanes
with acetylcyclohexylsulfonyl peroxide. Zhur. prikl. khim. 37
no. 4:920-922 Ap '64.
(MIRA 17:5)

L 16666-65 EWT(m)/EPF(c)/EWP(j)/EWA(h)/EWA(l) Pc-l/Pr-l/Pa-l RM

ACCESSION NR: AP4044020

8/0063/64/009/004/0475/0476

AUTHORS: Filippov, M.T.; Dzhagatspanyan, R.V.; Motsarev, G.V.; Zetkin, V.I. β

TITLE: Radiation chlorination of ethyltrichlorosilane, methyltrichlorosilane and dimethyldichlorosilane

SOURCE: Vsesoyuznoye khimicheskoye obshchestvo. Zhurnal, v. 9, no. 4, 1964, 475-476

TOPIC TAGS: radiation chlorination, reaction mechanism, alkylchlorosilane chlorination, liquid phase radiation chlorination, ethyltrichlorosilane, methyltrichlorosilane, dimethyldichlorosilane, chloroethyltrichlorosilane, chloromethyltrichlorosilane, chlorination inhibition, polychloromethylchlorosilane

ABSTRACT: The reaction mechanism of radiation-initiated chlorination of alkyl-chlorosilanes was studied. Liquid phase Co-60 radiation-initiated chlorination of ethyltrichlorosilane with molar ratios of Cl/silane ranging from 0.15 to 0.35 resulted in the formation of α and β monochloro derivatives only, with the proportion of $\beta:\alpha = 1.72$ when reactant ratio was 0.26 or 0.35, and $\beta:\alpha = 1$ when
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L 16666-65

ACCESSION NR: AP4044020

reactant ratio = 0.15 or 0.18. Chlorination of methyltrichlorosilane with Cl/silane molar ratios ranging from 0.20 to 0.81 gave about 9% $\text{CH}_2\text{ClSiCl}_3$, and a total concentration of higher chloro derivatives approximately proportional to the solar ratio. Changing the dose rate from 1 to 50 rad/sec. had no effect on the product. Lowering temperature from 20 to 00 lowered overall yield slightly but increased yield of polychloro derivatives. Air retarded the reaction. A radical chain mechanism is discussed for the radiation chlorination of methyltrichlorosilane wherein the rate of formation of $\text{CH}_2\text{ClSiCl}_3$ and overall reaction is determined by the reaction $\text{CH}_3\text{SiCl}_3 + \text{Cl} \rightarrow \cdot\text{CH}_2\text{SiCl}_3 + \text{HCl}$, and the rate of its disappearance is determined by the reaction $\text{ClOCH}_2\text{SiCl}_3 + \text{Cl} \rightarrow \cdot\text{CHClSiCl}_3 + \text{HCl}$. $\text{CH}_2\text{ClSiCl}_3$ is chlorinated about 10 times faster than CH_3SiCl_3 ; increasing temperature from 0 to 24.40 increased this chlorination rate about 3 times; the energy of activation is about 7300 cal/mol. The same general rules apply to the chlorination of dimethyldichlorosilane as to methyltrichlorosilane; the rate of the dimethyldichlorosilane chlorination at 00 is 19 times faster than for chlorinating methyltrichlorosilane; its energy of activation is 6100 cal/mol. The effects of the Cl/silane ratio in radiation chlorination are the same as in

Card 2/3

L 16666-65

ACCESSION NR: AP4044020

chemically initiated chlorination; the same rules and the radical chain mechanism of photochemically and chemically initiated chlorination obtain for radiation chlorination. Orig. art. has: 2 tables and 9 equations.

ASSOCIATION: None

SUBMITTED: 19Nov63

SUB CODE: GC

NR REF SOV: 004

ENCL: 00

OTHER: 000

Card

3/3

L 16061-65 EWT(m)/EPF(c)/EWP(j) Pc-4/Pr-4 RM
ACCESSION NR: AP4046175 S/0079/64/034/009/2911/2915

AUTHOR: Motsarev, G. V.; Rozenberg, V. R.; Tarasova, T. T. B

TITLE: Halogenation of aromatic silanes XIV: Bromination of phenylmethyldichlorosilane

SOURCE: Zhurnal obshchey khimii, v. 34, no. 9, 1964, 2911-2915

TOPIC TAGS: halogenation, aromatic silane, phenylmethyldichlorosilane, bromination, aryl alkyl chlorosilane, ionic catalyst

ABSTRACT: The bromination of aryl-alkylchlorosilanes is briefly reviewed. Bromination of the title compound was conducted with dry bromine under diffused daylight with or without ionic catalysts (I, SbCl_3) at various temperatures. The procedure is described, yields and identification of end products reported. Bromination without catalysts and a 1:1 molar ratio of the reagents led between 0-25 C to the formation of monobromophenylmethyldichlorosilane (90% yield). However, higher temperatures, to 60C yielded 35% of the mono-compound and products derived from splitting of the Si-C_{ar} bond in the phenylmethyldichlorosilane. A

Card 1/2

L 16061-65

ACCESSION NR: AP4046175

1:2 molar ratio led to synthesis of a mixture of mono- and dibromo compounds, as well as $C_6H_4Br_2$, C_6H_5Br , etc. Other ratios were not successful. Splitting was more pronounced and proceeded faster in the presence of catalysts (10-15C). The new mono- and dibromophenylmethyldichlorosilanes, mono- and dibromophenylmethyldiethoxysilanes isolated from the end product are described. It was determined that the CH_3SiCl_2 group directs the bromine atoms mainly towards the ortho and para position on the aromatic ring. "The fundamental analysis was conducted by M. A. Teplyashina's staff, for which the authors wish to express their thanks." Orig. art. has: 1 table

ASSOCIATION: None

SUBMITTED: 18Mar63

SUB CODE: CH

ENCL: 00

NO REF SOV: 009

OTHER: 000

Card 2/2

MOTSAREV, G.V.; YAKUBOVICH, A.Ya.

Halogenation of aromatic silanes. Part 16: Certain features of
the reaction of phenyltrichlorosilane with iodine chlorides.
Zhur. ob. khim. 35 no.6:1056-1057 Je '65. (MIRA 18:6)

MOTSAREV, G.V.; YAKUBOVICH, A.Ya.; PONOMARENKO, V.A.; SNEGOVA, A.D.;
IVANOVA, T.M.

Substitution chlorination of phenyltrichlorosilane Zhur. ob. khim.
35 no.4:756-757 Ap '65. (MIRA 18:5)

MOTSAREV, G.V.; YAKUBOVICH, A.Ya.; ROZENBERG, V.R.; FILIPPOV, M.T.;
DZHAGATSPANYAN, R.V.; BARDENSHTEYN, S.B.; KOLBASOV, V.I.;
ZETKIN, V.I.

Halogenation of aromatic silanes. Part 17: Addition of chlorine
to phenyl-trichlorosilane. Preparation of hexachlorocyclohexyl-
trichlorosilane and the mechanism of its formation. Zhur. ob.
khim. 35 no.7:1178-1183 J1 '65. (MIRA 18:8)

MOTSAREV, G.V.; YAKUBOVICH, A.Ya.; PONOMARENKO, V.A.; SNEGOVA, A.D.,
IVANOVA, T.M.

Substitution chlorination of phenyltrichloroethylene. Zhur. obshch. khim.
35 no. 12:2167-2176 D 1965. (MIRA 19:1)

1. Submitted July 8, 1962.

L 36712-65 EPP(c)/EWP(j)/EWT(m)/T Pc-L/Pr-L RM/DJ

ACCESSION NR: AP5003125

S/0080/85/038/001/0211/0213 29

AUTHOR: Motsarev, G. V.; Rosenberg, V. R. 8

TITLE: Preparation and properties of certain polychloro derivatives of trimethylchlorosilane and trimethylethoxysilane. Communication VIII in a series of works on the halogenation of aliphatic silanes and siloxanes

SOURCE: Zhurnal prikladnoy khimii, v. 38, no. 1, 1965, 211-213

TOPIC TAGS: trimethylchlorosilane, chlorination, polychloroderivative of trimethylchlorosilane, synthesis, properties, stability, solubility, melting point

ABSTRACT: Trimethylchlorosilane was intensively chlorinated (1:19 ratio of $(CH_3)_3SiCl:Cl_2$) at 53-65°C in CCl_4 in the presence of azobisisobutyronitrile initiator to give a 50% yield of the previously unknown tris(trichloromethyl)chlorosilane. $(CCl_3)_3SiCl$ crystallized completely after CCl_4 was removed, melted at 150.3-150.5°C without decomposition, and was soluble in organic solvents. Its CCl_3-Si bonds were practically unaffected by water. This compound was somewhat more

Card 1/2

L 36712-65

ACCESSION NR: AP5003125

stable and less reactive than bis(trichloromethyl)dichlorosilane. Orig. art. has:
no graphics

ASSOCIATION: None

SUBMITTED: 25Dec62

ENCL: 00

SUB CODE: GC, OC

NR REF SOV: 002

OTHER: 002

Card2/2

L 13484-66 EWT(m)/EWP(j) RM

ACC NR: AP6002217

SOURCE CODE: UR/0080/65/038/012/2797/2803

AUTHOR: Motsarev, G. V.; Rosenberg, V. R.

ORG: none

23 7.44.55

TITLE: Preparation of phenyl-(monochloromethyl)-dichlorosilane

SOURCE: Zhurnal prikladnoy khimii, v. 38, no. 12, 1965, 2797-2803

TOPIC TAGS: organosilicon compound, chlorination, dimethyldichloro-silane, silane

ABSTRACT: Batch and continuous liquid phase processes of chlorinating phenylmethyldichlorosilane were studied in order to determine optimum conditions and methods for the synthesis of $C_6H_5(CH_2Cl)SiCl_2$. In the batch process, the initial concentration of azobisisobutyronitrile initiator was 0.1-0.3 wt % and the $C_6H_5(CH_3)SiCl_2$ to Cl_2 molar ratio varied from 10 to 1. In the continuous process (continuous removal and vacuum distillation of reaction products) the initiator concentration was 0.2% and the $C_6H_5(CH_3)SiCl_2:Cl_2$ molar ratio was 10-2. For both operations the optimum temperature was 110°-115°C. Product composition as a function of the ratio of reagents for batch chlorination is shown in fig. 1.

Card 1/2

UDC: 542.944+547.245

L 13484-66

ACC NR: AP6002217

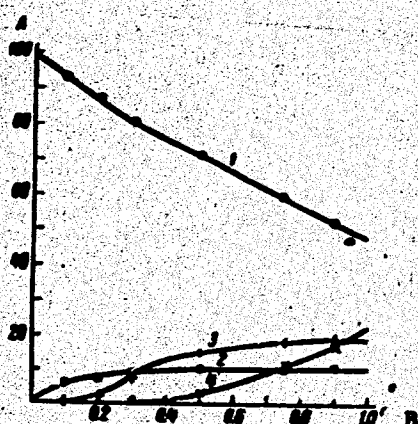


Fig. 1. A--product composition in %; B--molar ratio of Cl_2 to $\text{C}_6\text{H}_5(\text{CH}_3)\text{SiCl}_2$; 1--unsaturated $\text{C}_6\text{H}_5(\text{CH}_3)\text{SiCl}_2$; 2-- $\text{C}_6\text{H}_5(\text{CH}_2\text{Cl})\text{SiCl}_2$; 3-- $\text{C}_6\text{H}_5(\text{CHCl}_2)\text{SiCl}_2$; 4-- $\text{C}_6\text{H}_5(\text{CCl}_3)\text{SiCl}_2$.

In a continuous operation a maximum 84% selectivity to $\text{C}_6\text{H}_5(\text{CH}_2\text{Cl})\text{SiCl}_2$ at 6.2% conversion level was achieved at 1 hour contact time. It was found that for both modes of operation (the molar ratio $\text{C}_6\text{H}_5(\text{CH}_3)\text{SiCl}_2$ to Cl_2) exerted the greatest effect on product distribution. For maximum yield of $\text{C}_6\text{H}_5(\text{CH}_2\text{Cl})\text{SiCl}_2$, a lower ratio of $\text{C}_6\text{H}_5(\text{CH}_3)\text{SiCl}_2$ to Cl_2 was required in the continuous process than in the batch process. Orig. art. has: 4 figures, 3 tables.

SUB CODE: 87/ SUBM DATE: 09Dec63/ ORIG REF: 007/ OTH REF: 001
Card 2/2

BIRYUKOV, I.P.; VORONKOV, M.G.; MOTSAREV, G.V.; ROZENBERG, V.R.; SAFIN, I.A.

Nuclear quadrupole resonance method of studying organosilicon
compounds containing Si-Cl and C-Cl bonds. Dokl. AN SSSR 162
no.1:130-132 My '65.

(MIRA 18:5)

1. Institut organicheskogo sinteza AN Latvyskoy SSR i Kazanskiy
fiziko-tekhnicheskii institut AN SSSR. Submitted November 17, 1964.

L 16007-66 EWP(j)/EWT(m) EM
ACC NR: AP6005519 (N) SOURCE CODE: UR/0080/66/039/001/0204/0207

AUTHOR: Motsarev, G. V.; Rozenberg, V. R.

ORG: none

TITLE: Preparation of phenyl(trichloromethyl)dichlorosilane

SOURCE: Zhurnal prikladnoy khimii, v. 39, no. 1, 1966, 204-207

TOPIC TAGS: organosilicon compound, silane, chlorination

ABSTRACT: Experiments on continuous liquid-phase chlorination of phenylmethyldichlorosilane in the presence of azobisisobutyronitrile for the purpose of preparing phenyl(trichloromethyl)dichlorosilane were carried out at 110-115°C by using the countercurrent method. The apparatus consisted of two reactors connected in series, phenylmethyldichlorosilane being supplied to one and chlorine to the other, and chlorination of $C_6H_5(CH_3)SiCl_2$ was carried out in both. This arrangement created the best conditions for obtaining the necessary degree of chlorination and the most complete binding of chlorine. The two-stage chlorination of phenylmethyldichlorosilane led to the formation of mainly $C_6H_5(CCl_3)SiCl_2$. 98-99% of the chlorine

UDC: 542.944+547.245

Card 1/2

L 16007-66

ACC NR: AP6005519

supplied having combined. Data showed that the conversion of $C_6H_5(CH_3)SiCl_2$ was close to 60% at the first stage and close to 40% at the second. The yield of $C_6H_5(CCl_3)SiCl_2$ amounted to about 65%. Orig. art. has: 1 figure, 1 table.

SUB CODE: 07/ SUBM DATE: 25Dec63/ ORIG REF: 002/ OTH REF: 000

Card 2/2

ACCESSION NR: AP4032495

S/0080/64/037/004/0747/0749

AUTHOR: Motsarev, G. V.; Rozenberg, V. R.

TITLE: Thermal decomposition of trichloromethyltrichlorosilane. Communica-
tion IX

SOURCE: Zhurnal prikladnoy khimii, v. 37, no. 4, 1964, 747-749

TOPIC TAGS: trichloromethyltrichlorosilane, thermal stability, thermal de-
composition, monochloromethyltrichlorosilane, dichloromethyltrichlorosilane

ABSTRACT: The thermal stability of the chloro derivatives of methyltrichloro-
silane was studied. The mono- and dichloromethyltrichlorosilane are complete-
ly stable on boiling, even in the presence of anhydrous FeCl_3 . Trichloromethyl-
trichlorosilane readily decomposes on boiling (160-175C) to form a 90% yield
of SiCl_4 and 13% yield of C_2Cl_4 . Orig. art. has: 2 equations.

ASSOCIATION: None

SUBMITTED: 18Mar63

SUB CODE: GC

DATE ACQ: 11May64

NO REF SOV: 002

ENCL: 00

OTHER: 001

Card 1/1

ACCESSION NR: AP4032507

S/0080/64/037/004/0920/0922

AUTHOR: Motsarev, G. V.; Rozenberg, V. R.

TITLE: Initiating the chlorination reaction of methylchlorosilanes with acetylcyclohexylsulfonyl peroxide. Communication VII in the series.

SOURCE: Zhurnal prikladnoy khimii, v. 37, no. 4, 1964, 920-922

TOPIC TAGS: chlorination, methylchlorosilane, acetylcyclohexylsulfonyl peroxide, initiator, chlorination initiator, chloromethyltrichlorosilane, polychloromethyltrichlorosilane, dimethyldichlorosilane, polychlorodimethyldichlorosilane, azobisisobutyronitrile, ultraviolet light

ABSTRACT: The chlorination of methyltrichlorosilane and dimethyldichlorosilane initiated by acetylcyclohexylsulfonyl peroxide was investigated. Reaction proceeds very low at 24-30C. At 50C with a $\text{CH}_3\text{SiCl}_3:\text{Cl}_2$ molar ratio of 1:0.3 there is complete conversion of the chlorine, forming 1 weight part of the monochloro- to 1.15 parts of polychloromethylsilanes. Reducing the peroxide ratio to 1:0.2 reduces the polychloro derivatives to 0.84 parts. The initiating action of this peroxide exceeds that of azobisisobutyronitrile and approaches that of ultra-

Card 1/2

ACCESSION NR: AP4034544

S/0020/64/155/005/1163/1166

AUTHORS: Dzhagatspanyan, R.V.; Filippov, M.T.; Motsarev, G.V.; Zetkin, V.I.; Rozenberg, V.R.

TITLE: Radiative chlorination of certain organochlorosilanes and organopolysiloxanes

SOURCE: AN SSSR. Doklady*, .v. 155, no. 5, 1964, 1163-1166

TOPIC TAGS: chlorination, irradiation chlorination, organochlorosilane, organopolysiloxane, chlorination mechanism, polydimethylsiloxane, polyphenylmethylsiloxane, ethyltrichlorosilane, methyltrichlorosilane, dimethyldichlorosilane, phenyltrichlorosilane, phenylmethyldichlorosilane, photochemical chlorination, substitution chlorination, addition chlorination, ionic mechanism, free radical mechanism

ABSTRACT: The mechanisms involved in the chlorination of various organosilane derivatives under the influence of Co⁶⁰ radiation were investigated. A polydimethylsiloxane resin, molecular weight 100,000-150,000, was chlorinated at 0°C as a 4% solution in CCl₄. After

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chlorination under 4200 rad/min. radiation the chlorine content was 50-55%; optimum reaction time was 15-30 minutes. Total radiation greater than 1.25×10^5 rad did not lead to a higher chlorine content, but promoted degradation of the polymer. By chlorinating polyphenylmethylsiloxane under the same conditions, products containing up to 56.1% chlorine were obtained. About 80% of the chlorine reacted with the aromatic nucleus and 20% replaced hydrogens on a methyl group. Chlorination of ethyltrichlorosilane (molar ratio $\text{Cl}_2 : \text{C}_2\text{H}_5\text{SiCl}_3 = 3:7$) at OC using 900 rad/min gave α - and β -monochloroderivatives in a ratio of 1:1.7, corresponding to results obtained by photochemical chlorination. On chlorinating methyltrichlorosilane and dimethyldichlorosilane the amount of monochloro derivatives in the reaction mixture did not depend on the molar ratio of reagents and the change in the amount of dosage did not influence the products of chlorination. The relative reaction rate of methyltrichlorosilane did not depend on the concentration of chlorine and at OC and 3300 rad/min equaled 0.148 ± 0.030 moles/liter-min. The magnitude is proportional to the square root of the power of dosage. The energy

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of activation is about 7300-6100 cal/mole for the reaction. Phenyltrichlorosilane and phenylmethyldichlorosilane were chlorinated at 0-150C at 5900 and 800 rad/min at 0-20C. The chlorine added to the double bond of the aromatic nucleus giving $C_6H_5Cl_6SiCl_3$ and $C_6H_5Cl_6(CH_3)SiCl_2$. This additive chlorination under radiation is analogous to photochemical chlorination. At 50C, addition chlorination products as well as products of substitution chlorination in the methyl group and the aromatic nucleus were formed. At 100-150C substitution chlorination of the aromatic nucleus predominated indicating ionic mechanism for the arylalkylchlorosilanes. A free radical mechanism was postulated for the alkylchlorosilanes. Orig. art. has: 11 equations and 1 table

ASSOCIATION: None

SUBMITTED: 16Nov63

ENCL: 00

ISR CODE: 00

NR REF SOV: 005

OTHER: 002

C-8 3/3

L 46029-66 EWT(d)/EWP(v)/EWP(k)/EWP(h)/EWP(l) GD/BC

ACC NR: AT6017616

(N)

SOURCE CODE: UR/0000/65/000/000/0226/0230

AUTHOR: Alishauskas, A. V.; Motskus, I. B.; Petraytis, K. A.

21
B+1

ORG: none

TITLE: Establishing an extremum in a multivariable problem of optimal design

SOURCE: Vsesoyuznaya konferentsiya po teorii i praktike samonastraivayushchikhsya sistem. 1st, 1963. Samonastraivayushchiyesya sistemy (Adaptive control systems); trudy konferentsii. Moscow, Izd-vo Nauka, 1965, 226-230

TOPIC TAGS: optimization, optimal control system, production engineering

ABSTRACT: The problem of reducing manufacturing errors are minimized by solving a multivariable optimization problem and using various forms of the gradient method. The objective function is formulated using a penalty function, to account for the existing inequality constraints. The four optimization algorithms considered are: 1. relaxation--variation from the initial condition for each variable separately; 2. gradient--at each step, the variation is performed in the anti-gradient direction for a given step size; 3. optimal gradient--gradient, with a step down to the minimum of the objective function in the same direction; 4. accelerated gradient--optimal gradient for the first three steps. Next direction determined the first and third minimum. Graph-

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ACC NR: AT6017616

ical results using all four methods are presented. Orig. art. has: 9 figures, 8 formulas.

SUB CODE: 13/

SUBM DATE: 22Nov65/

ORIG REF: 001

auth
Card 2/2

DIECKHOFF, J.; MOTSCH, K.

Contribution to lung diseases in childhood. Cesk. pediat. 20
no.3:402-403 Mr '65

1. Kinderklinik der Humboldt-Universität , Berlin.

MOTSEFNOK, M.

Marina Chernysh and her brigade. Sov. profsoiuzy 17 no.29:16-19
0 '61. (MIRA 14:9)

(Socialist competition)

MOTSENOK, M. (g.Perm')

Enthusiast. Sov. profsoiuzy 18 no.9:31-32 My '62. (MIRA 15:4)
(Trade unions--Officials and employees)

MOTSERELIYA, A. V.

Preobrazovaniye Kolkhidy (Transformation of The Colchis Area) Moskva, Izd-vo
Akademii Nauk SSSR, 1954.

87 P. Illus.

"Literatura": P. 87

SO: 3IN/5
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MOTSERELIYA, A.V.

USSR/Geography - Natural resources

Card 1/1 : Pub. 86 - 13/38

Authors : Motsereliya, A. V.

Title : The Colchian depression

Periodical : Priroda 43/12, 79-89, Dec 1954

Abstract : A description is given of the topography, soil formation and climate of the Colchian depression, located on the east shore of the Black Sea. An account is given of the work of the Soviet Government in reclaiming this long unutilized region which is to become a source of natural wealth because of its mild climate and rich soil. Illustrations; map; diagrams.

Institution :

Submitted :

MOTSERELIYA, A.V., kandidat sel'skokhozyaystvennykh nauk.

Reclamation of slopes for growing tea in subtropical regions of
Krasnodar Territory. Zemledelie 4 no.10:66-70 0 '56. (MLRA 9:11)
(Krasnodar Territory--Tea)

KOTSERELIYA, A.V.

Warping of bogs in Kolchida [with summary in English] Pochvovedenie
no.3:59-66 Mr '58. (MIRA 11:4)

1. Kolchidskiy filial Vsesoyuznogo nauchno-issledovatel'skogo
instituta chaya i subtropicheskikh kul'tur, g. Poti.
(Colchis--Bogs)

MOTSIKULASHVILI, M.G.; YURCHENKO, A.M.

Worthy welcome to the 22d Congress of the party. Koms. i ov.
prom. 16 no.10:5-6 0 '61. (MIRA 14:11)

1. ~~Goriyskiy~~ konservnyy zavod.
(Gori--Canning, industry)

Motskin / Ya. M.

AID P - 3520

Subject : USSR/Power Eng
Card 1/1 Pub. 26 - 14/30
Authors : Motskin, Ya. M. and A. Z. Rumanov, Engs.
Title : ~~Mounting of large reinforced concrete wall slabs~~
Periodical : Elek. sta., 9, 44-48, S 1955
Abstract : The article describes the construction of a powerhouse using reinforced concrete slabs instead of bricas. The details of frame welding and the process of slab mounting are given. Nine diagrams.
Institution : None
Submitted : No date

MOTSKIN, Ya.M., inzhener.

Erecting precast reinforced concrete elements of the frame of the
main building of a heat electric power station. Bet.1 shel.-bet.
no.6:223-224 Je '56. (MLBA 9:8)
(Precast concrete construction)

MOTSKUS, A. P., Cand Agr Sci -- "Effectiveness of various types of winter feeding and summer maintenance of cows under the conditions of ^{for} USSR." Len-Pushkin, 1961. (Min of Agr RSFSR. Len Agr Inst) (KL, 8-61, 254)

- 377 -

5(3)

AUTHORS:

Pigulevskiy, G. V., Kozhin, S. A.,
Motakus, D. V.

SOV/79-29-6-60/72

TITLE:

Reduction of Δ^3 -Menthene Oxide by Lithium Aluminum Hydride
(Vosstanovleniye okisi Δ^3 -mentena alyumogidridom litiya)

PERIODICAL:

Zhurnal obshchey khimii, 1959, Vol 29, Nr 6. pp 2053-2056 (USSR)

ABSTRACT:

The present report contains preliminary results obtained from an analysis of the reduction of Δ^3 -menthene oxide by LiAlH_4 . This oxide, the initial product, was obtained by the oxidation of the mixture of Δ^3 -menthene and p-methane with perbenzoic acid. The mixture of these hydrocarbons was prepared by partial hydration of the mixture of Δ^3 -menthene and Δ^2 -menthene (Ref 5), which for its part resulted from the thermic cleavage of methyl acetate (Refs 5,6). Reduction of menthene oxide was effected with LiAlH_4 under standard and more rigorous conditions (at a higher temperature and finally without solvents). In the first case oxidation was not fully accomplished and in the second case it was fully accomplished. The composition of the

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Reduction of Δ^3 -Menthene Oxide by Lithium Aluminum
Hydride

SOV/79-29-6-60/72

products of reduction of the Δ^3 -menthene oxide varies also according to the conditions of the reduction. In all cases the corresponding alcohols result as main products: menthanol-4 and one of the stereoisomeric menthanols-3 of the neo-series, probably neo-isomenthol. During the reduction under standard conditions menthanol-4 (70 % yield) is the main product, whereas in the reduction under more rigorous conditions menthanol-3 (70 %) prevails. Menthanol-4 was characterized by the synthesis of phenyl urethane and by the spectroscopic comparison. For the identification of the secondary alcohol formed in the reduction of Δ^3 -menthene oxide, its p-nitro-benzoate was synthesized, which corresponds, according to reference 9, to the p-nitro-benzoate of the dl-neo-isomenthol. In virtue of the results obtained it is assumed that Δ^3 -menthene oxide is a mixture of stereoisomers, which due to steric factors may be reduced more or less easily by LiAlH_4 and which accounts for the varying composition of the reduction products. Additional, more detailed examinations will follow. There are 10 references, 3 of which are Soviet.

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Reduction of Δ^3 -Menthene Oxide by Lithium Aluminum Hydride SOV/79-29-6-60/72

ASSOCIATION: Leningradskiy gosudarstvennyy universitet (Leningrad State University)

SUBMITTED: May 25, 1958

Card 3/3

FIGULEVSKIY, G.V.; MOTSKUS, D.V.; RODINA, L.L.

Dehydration of carotol. Zhur.ob.khim. 32 no.2:656 F '62.
(MIRA 15:2)

1. Leningradskiy gosudarstvennyy universitet.
(Carotol)

FIGULEVSKIY, G.V.; MOTSKUS, D.V.

Selenane-type sesquiterpene alcohol extracted from essential oils
of wild carrots (*Daucus carota*). Zhur.ob.khim. 32 no.7:2365-2367
Jl '62. (MIRA 15:7)

1. Leningradskiy gosudarstvennyy universitet.
(Sesquiterpenes) (Essences and essential oils) (Alcohols)

FIGULEVSKIY, G.V.; MOTSKUS, D.V.; RODINA, L.L.

Essential oil of fruits of wild carrot (*Daucus carota*) growing
in Central Asia. Zhur.prikl.khim. 35 no.5:1143 My '62.
(MIRA 15:5)

(Essences and essential oils)
(Carrots)

FIGULEVSKIY, G.V.; MOTSKUS, D.V.

Essential oil of fruits of *Daucus carota* growing in the Ossetian
Autonomous S.S.R. Zhur.prikl.khim. 35 no.6:1355-1360 Je '62.
(MIRA 15:7)

(Ossetia--Essences and essential oils)

IGULEVSKIY, G.V. [deceased] (Leningrad); KOVALEVA, V.I. (Leningrad);
MOTSKUS, D.V. (Leningrad)

Study of essential oils derived from the fruit of wild carrot
(Daucus carota L.) collected in various regions. Rast. res. i
no.2:227-230 '65. (MIRA 18:1)

MOTSKUS, I. B. Cand Tech Sci -- (diss) "Study of ^{the} gas-dynamics and electric
processes accompanying the extinguishing of the arc in ^{an air current.} ~~streams of air.~~
Mos, 1957. 21 pp (Acad Sci USSR. Power Engineering Inst im G. M. Krzhizhanovskiy),
110 copies (KL, 42-57, 93)

MOTSKUS, Ionas Balisovich, inzh.; FILARETOVA, Antonina Sergeyevna,
inzh.; SENKEVICH, I.V., inzh., ved.red.; MORDVINOVA,
N.P., inzh., ved. red.; PONOMAREV, V.A., tekhn. red.

[System for determining the characteristics of an electric arc and measuring the parameters of compressed air in the arc-quenching chambers of air switches. Stand for studying voltage distribution in the gaps of an arc-type rectifier]
Ustanovka dlia opredeleniia elektricheskikh kharakteristik dugi i izmereniia parametrov potoka sshotogo vozdukha v gasil'nykh kamerakh vozdukhnykh vykliuchatelei. Stand dlia issledovaniia raspredeleniia napriazheniia meshdu prome-zhutkami dugovogo ventilia. [By] A.S. Filaretova. Moskva, Filial Vses. in-ta nauchn. i tekhn. informatsii, 1957. 21 p. (Peredovoi nauchno-tekhnicheskii i proizvodstvennyi opyt. Tema 35. No.P-57-31/3) (MIRA 16:3)
(Electric current rectifiers) (Electric switchgear)

88335

S/024/60/000/006/001/015
E194/E484

97100

AUTHORS: Motkus, I.B. and Shal'tyanis, V.R. (Kaunas)

TITLE: ~~The Application of an Electronic Computer~~ for
Automatic Selection of the Optimum Variant of Future
Development of Electric Power Supply Systems

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh
nauk, Energetika i avtomatika, 1960, No.6, pp.15-22

TEXT: Rural power distribution systems of up to 10 kV are usually
designed without considering variants. It is a very complex
dynamic problem to select the optimum economic variant for future
development of such systems, and the use of existing mathematical
programming methods to solve problems of this kind as a whole
is very difficult. If these methods are used only a single
optimum solution is determined and the consequences of deviating
from this solution are unknown. A perfectly acceptable practical
solution may, however, be obtained by means of algorithms.
The algorithm for calculating the minimalizing functions is
formulated in the light of the capabilities of modern computers on
the basis of general system design formulae, particular prices for
individual components of the system and also allowance for existing
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S/024/60/000/006/001/015
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The Application of an Electronic Computer for Automatic Selection
of the Optimum Variant of Future Development of Electric Power
Supply Systems

technical standards, tolerances and the like. The algorithm of variant selection, which excludes the possibility of considering obviously irrational variants, is based on qualitative conditions that govern the sequence of change of the parameters and certain relationships between them. A priori conditions are also introduced which confine alterations in the main parameters within rational limits. A particular example of programme is considered, namely selection of the most economic variant of construction and development of a 10 kV distribution system allowing for growth over two successive five year periods. Means of increasing the transmission capacity that are considered are: increasing the section of the conductors; the use of low voltage power factor correction capacitors with automatic over-voltage disconnection; 10/0.4 kV transformers with on-load tap changing; and several combinations of these methods. A typical feeder circuit is presented with feeders, power transformers, capacitors and the like.

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The rate of load increase is taken as 75% in five years, the power factor at maximum load is 0.85 and the mean power factor 0.75. The costs are calculated with allowance for costs in the low voltage circuits and additional losses of power in systems of 35 kV and upwards. The programme formulated is universal and can be used for practically any radial distribution network with a comparatively small amount of initial information. The algorithm of variants is first considered, the following being included: selection of wire size according to current densities; location of voltage control points; the degree of compensation; combination of means of increasing the transmission capacity. The total number of variants to be considered is 615 and the programme was used twice both with and without counter-control so that the total number of variants considered is 1230. The calculation algorithm is then considered; it governs the variable part of the total costs which depends upon the selection of the variant and which in the Card 3/6

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particular case considered is about 20% of the total cost. Calculation of a single variant uses the following information, some of which is initially given and some of which is calculated during the course of the solution: the length of branch lines; the power loading of sub-stations; the system circuit matrix; standard transformer ratings; location of low voltage capacitors; current density factors; standard wire gauges; location of tap changing transformers; magnitudes that approximately characterize the load distribution law. Some 36 formulae used in the calculations are given. A simplified programme diagram is given and is briefly described. The programme is formulated for a computer type БЭСМ-2 (BESM-2) which has an accuracy of calculation of about 9 significant figures, the capacity of the memory is 2047 numbers, the operating speed is 8 to 10000 operations per second. Design of a feeder on the machine takes about three hours and a single variant about ten seconds. The calculating

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time could be appreciably reduced if the machine had a larger memory unit. On the basis of design of many variants, a table of optimum variants has been drawn up using counter control of voltage at the 35/10 kV sub-stations. The costs are calculated with allowance for the additional capital investment for on-load tap changing in the 35 kV transformer. The absolutely optimum variant, that is the one without limitation on the means of increasing the transmission capacity, shows that it is not advisable to use small conductors initially and later change them for a larger one. The conductor section of the 10 kV system should be selected to suit the load in ten years time taking a current density of 1 A/mm^2 . In the first stage, capacitance compensation is installed in forty sub-stations and in the second period it is installed in the majority of the sub-stations. Even if no method of control is provided full-size conductors should be used from the start and the costs are then 10% greater than for the absolute optimum solutions. X

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In particular, the optimum variant is 10 to 20% more economic than a typical variant designed in accordance with current regular practice. The economy increases with increase in the complexity of methods used to improve the transmission capacity. It is shown that error in certain of the initial data has very little influence on selection of the optimum variants. There are 3 figures, 1 table and 5 references: 4 Soviet and 1 non-Soviet.

SUBMITTED: June 3, 1960

Card 6/6

BORISOV, V.M. (Moskva), MOTSEKUS, I.B. (Moskva)

Problems of the experimental and theoretical determination of the recovery of the dielectric strength of an air gap in an air breaker. Izv. AN SSSR. Otd. tekhn. nauk. Energ. i avtom. no.6:28-34 M-D '60. (MIRA 13:12)

(Electric circuit breakers)

S/271/63/000/003/049/049
A060/A126

AUTHORS: Motakus, I.B., Shal'tyanis, V.R., Lecuss, V.L.

TITLE: Optimisation problems in the task of raising the throughput capacity of power distribution grids

PERIODICAL: Referativnyy zhurnal, Avtomatika, telemekhanika i vychislitel'naya tekhnika, no. 3, 1963, 84, abstract 3B498 (Dokl. na 4-y Mezhdvuz. konferentsii po primeneniyu fiz. i matem. modelirovaniya v razlichn. otraslyakh tekhn. Sb. 2, Moscow, 1962, 73 - 82)

TEXT: As an example of a problem in optimal design of industrial systems the authors analyze the problem of finding the values of the principal parameters of electrical distribution grids, corresponding to the estimated minimum losses. The basic characteristic traits of contemporary production systems are enumerated: Multidimensionality, connectivity, nonlinearity, balancing of the elements, dynamicity. It is concluded that the problem of optimal synthesis of such systems leads usually to multiextremal problems. The mathematical complexity of the solution of such problems is emphasized. To simplify their solution

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S/271/63/000/003/049/049
A060/A126

Optimization problems in the task of raising

in the design of systems it is proposed to use separate optimization and the limits of its expedient application are estimated. A method is set forth of constructing an algorithm for finding the optimal configuration of a construction and increasing the throughput capacity of a group of feeders corresponding to the least losses. The algorithm is realized on the computer BESM-2 (BESM-2). The organization of the program is described in detail. The results of calculations are discussed. It is noted that in order to solve problems of optimal design high-speed computers are required possessing a large-volume operating memory and well-developed possibilities of output of results. There are 4 figures and 1 reference.

V. M.

[Abstracter's note: Complete translation]

Card 2/2

MOTSKUS, I.B. [Mockus, J.]

Methods of technical and economic calculations in power engineering.
Trudy AN Lit. SSR. Ser. B no.1:209-213 '62. (MIRA 17:8)

1. Institut energetiki i elektrotekhniki AN Litovskoy SSR.

MOTSKUS, I. B. (Kaunas); ALISHAUSKAS, A. V. (Kaunas); YUSHKA, F. P. (Kaunas)

Some aspects of the use of electronic computers for selecting
the most economical constructional parameters. Zhur. vych.
mat. i mat. fiz. 2 no.5:948-951 S-0 '62. (MIRA 16:1)

(Programming(Electronic computers))

MOTSKUS, I.B. (Kotvas)

Method of successive search for an approximate solution to certain
problems of optimum designing. Zhur.vych.mat.i mat.fiz. 2
no.6:1139-1144 N-D '62. (MIRA 15:11)
(Programming (Mathematics)) (Approximate computation)

L 56038-65 ENT(d)/ENP(v)/T/ENP(k)/ENP(h)/ENP(l) Pf-4 IJP(c)
 ACCESSION NR: AR5012183 UR/0372/65/000/003/V053/V053
 512.25/.26+519.3:330.115

30
B

SOURCE: Ref. zh. Kibernetika. Svodnyy tom, Abs. 3V198

AUTHOR: Motkus, I. B.

TITLE: Use of the Monte-Carlo method to solve polyvariational and combinatorial problems 16

CITED SOURCE: Sb. Obshch. vopr. primeneniya veroyatnostn. i statist. metodov. Vyp. 4. Kiev, Gostekhnizdat USSR, 1963, 30-41

TOPIC TAGS: polyvariational problem, combinatorial problem, trial and error, computer programming, production, variant selection, control theory, Monte Carlo method 14

TRANSLATION: A procedure employing the random trial method is proposed for solving problems relating to the selection of an optimal variant of complex manufacturing systems. Each trial represents a calculation of an object function subject to minimization at some system parameter. The given number of trials should be distributed in the parameter value region in the most effective manner. The entire parameter value region is divided into non-void sets. A series of

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test trials carried out for such sets yields an optimal set for which the mean value of the object function will be minimal in trials, while the average gain obtained as a result of N trials will be maximal. The minimum of the object function in the considered region is submitted as another criterion for isolating the optimal set and this leads to the localization of the minimum point by the boundaries of the isolated set. The article considers the feasibility of a multistage subdividing of regions when the isolated optimal set divides, in turn, into a number of sets and the process repeats itself from the beginning. A procedure is presented for controlling the selection of a "rational area" derived from qualitative representations and experimentally. N. Terent'yeva

SUB CODE: IE, MA

ENCL: 00

Cord

2/2